Moving from management information to data driven intelligence: the impact on collection development
NAG seminar: November 2018

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My contribution today should be treated as "food-for-thought"

I have a short time so I will limit my contribution to libraries in the context of HE and Teaching and Learning

Can collection development be done more effectively by algorithms (AI?) – i.e. without human (librarian) intervention?

Preamble
some context

"The world's most valuable resource is no longer oil, but data. Smartphones and the internet have made data abundant, ubiquitous and far more valuable"

The world's most valuable resource is no longer oil, but data. The Economist. 6 May 2017
http://www.economist.com/news/leaders/21721656-data-economy-demands-new-approach-antitrust-rules-worlds-most-valuable-resource

AI is responsible for many useful tools that have already become mainstream: speech and image recognition, search engines, spam filters, product and movie recommendations

AI also has the potential to enable promising technologies like driverless cars, tools for rapid scientific discovery and digital assistants for medical image analysis……

[and library collection development?]

Do the benefits of artificial intelligence outweigh the risks? Frank L. Ruta The Economist. 10th September 2018
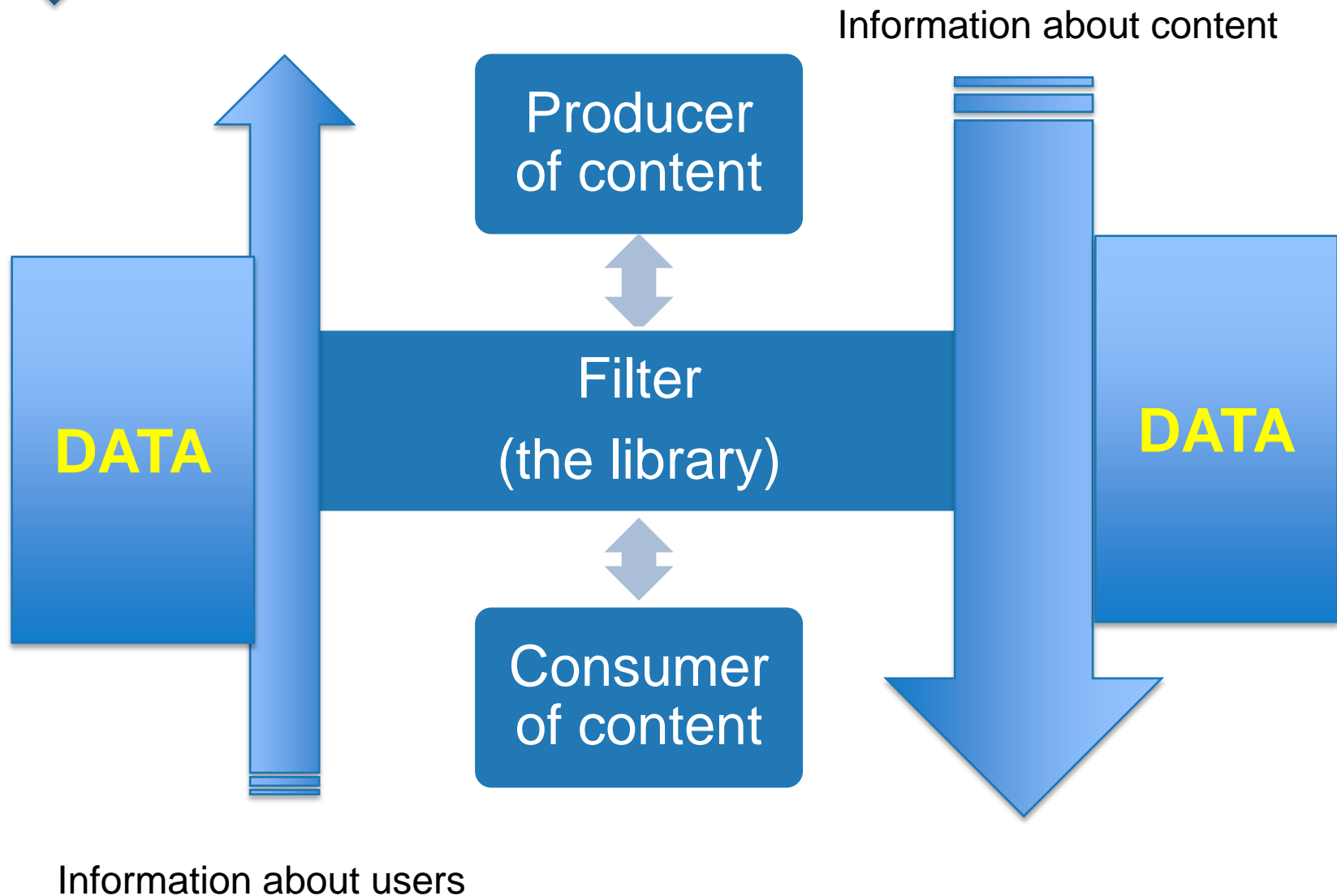https://www.economist.com/open-future/2018/09/10/do-the-benefits-of-artificial-intelligence-outweigh-the-risks

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WIRED

"Platforms are eating the world"

"Now, market upstarts are displacing market leaders faster than ever before as entire industries transform. We are in the midst of a **seismic shift in business models**, powered by the Internet and a **generation of connected users**.

Business leaders, today, develop platforms that connect diverse participants with one another and enable them to interact and transact"

Sangeet Paul Choudary, Geoffrey Parker and Marshall Van Alstyne. Outlook 2014: Platforms are Eating the World. Wired Blog October 2014 http://www.wired.com/insights/2013/12/outlook-2014-platforms-eating-world/

Higher Education Academy | TRANSFORMING TEACHING INSPIRING LEARNING

Review of the research literature on defining and demonstrating quality teaching and impact in higher education

Lucy Strang, Julie Bélanger, Catriona Manville and Catherine Meads

https://www.heacademy.ac.uk/system/files/resources/defining_and_demonstrating_teaching_quality_and_impact.pdf

"the importance of 'high quality teaching' in higher education (HE) is becoming increasingly emphasised both in the United Kingdom (UK) and abroad

Excellence in teaching has become entrenched in higher education policy and in the educational strategies of academic institutions, and **increasingly linked to the performance and assessment of these institutions"**

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2016 top trends in academic libraries
A review of the trends and issues affecting academic libraries in higher education

ACRL Research Planning and Review Committee

Collection assessment trends

There has been a remarkable shift to the incorporation and integration of more continuous, ongoing, flexible, and sustainable review of collections rather than ad-hoc project-based models."Rightsizing" the collection has become a norm

Evidence of learning: Student success, learning analytics, credentialing

Student success continues to be an important focus for higher education institutions, where the trend towards performance-based funding and accreditation criteria includes an emphasis on learning outcomes, retention, and matriculation.

http://crln.acrl.org/content/77/6/274.full

Why are libraries interested? -Trends

Trend 1 :Rising interest in big data, data science and AI in general

Trend 2: Library systems are becoming more open and more capable at analytics

Trend 3 : Assessment and increasing demand to show value are hot trends

Trend 4 : Rising interest in learning analytics

Trend 5 : Increasing academic focus on managing research data provides synergy

5 reasons why library analytics is on the rise. By Aaron Tay. Musings about Librarianship [blog] 18th November 2016http://musingsaboutlibrarianship.blogspot.com/2016/11/5-reasons-why-library-analytics-is-on.html

"the library has an integral role in the university's mission of research and teaching, not just a supporting one."

UK Scholarly Reading and the Value of Library Resources: library may have a correlation to the overall strength Summary Results of the Study Conducted Spring 2011. Carol Tenopir and Rachel Volentine. Jisc Collections. February 2012

JOURNAL OF LIBRARY INNOVATION

Volume 6, Issue 1, 2015

Article

Academic Libraries and Innovation: A Literature Review

Curtis Brundy

Academic libraries are facing times of unprecedented challenge and unparalleled change. **Innovation has moved from a consideration to a necessity**.

http://www.libraryinnovation.org/article/view/420/625

Libraries and data

Data, analytics and collection development today

In challenging times, the requirement to make decisions (particularly in relation to resources spend) that are data-driven and evidence-based have become increasingly significant.

Back to basics: the importance of library collections. By Steve Rose. Sconul. Focus 70 [Editorial] 2017
https://www.sconul.ac.uk/sites/default/files/documents/3.Editorial.pdf
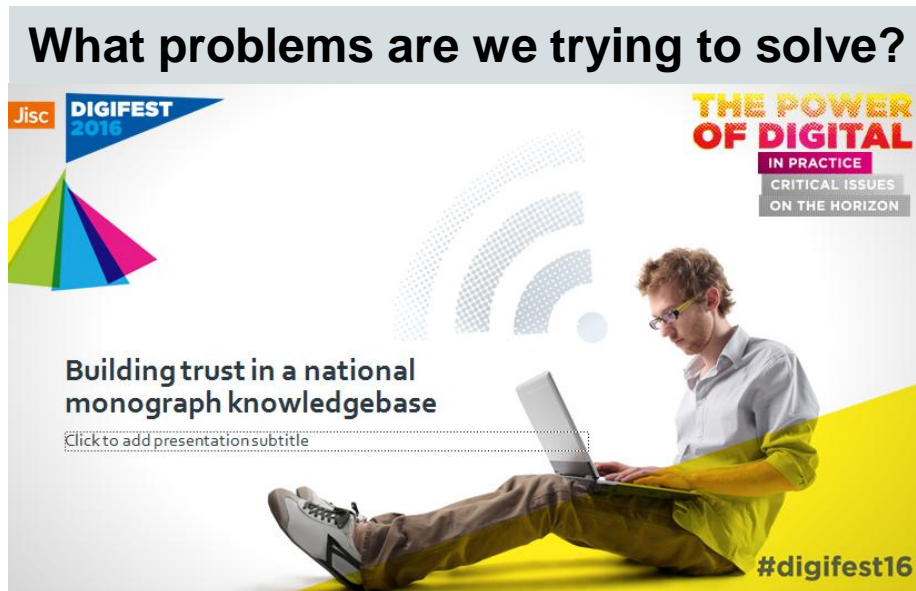
"Libraries want to make **data-driven decisions about the management of their digital and print book collections** but the data that is currently available does not allow them to do this with confidence"

http://www.slideshare.net/JISC/building-trust-in-a-njiational-monograph-knowledgebase-sc-digifest-2016

"There are two main approaches to collection assessment:"

Collection-centered
Analyzes the contents of a collection for quantity and quality, makes comparisons to peer institutions, focuses on the collection's condition, and measures against core subject titles.

Use/user-centered
The latter is focused on how materials are being used and by whom. This approach helps the library gain insight into the perceived needs of a library user, or perceived demand

Hunt & Gather: The Fundamentals of Collection Assessment, By Caroline Muglia ProQuest blog
https://www.proquest.com/blog/pqblog/2016/Hunt--Gather-The-Fundamentals-of-Collection-Assessment.html

Vendor-provided,
Institutionally generated,
Peer comparison.

Vendor-provided data:
- (COUNTER) data, or "Codes of Practice" enables publishers and vendors to report usage **data in a standardized format**
- Altmetrics enables authors to see the impact of their publication (paper, book, or dataset) by monitoring references not only from scholarly journals, but also social media outlets, newspapers, and policy documents. Altmetrics data can be easily applied to assessment projects to **measure usage and assign value to costly resources.**

Hunt & Gather: The Fundamentals of Collection Assessment. By Caroline Muglia. ProQuest blog. Sept 2016
https://www.proquest.com/blog/pqblog/2016/Hunt--Gather-The-Fundamentals-of-Collection-Assessment.html

Institutional
- Print collection- e.g.
  - Circulation rates
  - Age or physical condition of the collection
  - Subjects that are most used
- Ebook use statistics, similar to data from the print collection
- Interlibrary loan (ILL). Lending data can provide information on the strength of the collection compared to neighboring institutions, and borrowing information can uncover potential gaps in the collection.
- Web …can provide valuable details on what users are accessing, from where, and for how long. Sometimes librarians pair this data with EZ Proxy or authentication data for a deeper understanding of the types of users accessing resources.

Peer comparison data:
Peer Analysis enables libraries to **compare unique and overlapping titles** from specific peer institutions, parsed by subject, category, and classification.

Hunt & Gather: The Fundamentals of Collection Assessment. By Caroline Muglia. ProQuest blog. Sept 2016
https://www.proquest.com/blog/pqblog/2016/Hunt--Gather-The-Fundamentals-of-Collection-Assessment.html

From management information to analytics

Management information – reports from the ILS

Out-of-the-Box Reports

Report	Description
Acquisitions (based on Funds Expenditures SA)	
Detailed Expenditures	Displays fund, title, and price information for items.
Expenditure Per Acquisition Method	Displays annual expenditures per acquisition method.
Expenditure Per Acquisition Method – Annual Trend	Displays a line chart of annual expenditures per acquisition method.
Expenditure Per Acquisition Method - Top 10	Displays a bar chart of the top 10 expenditures per acquisition method.
Expenditure Per Classifications	Displays annual expenditure per classification.
Expenditure Per Classifications - Top 10	Displays a bar chart of the top 10 annual expenditures per classification.
Expenditure Per Fund Ledger Code	Displays annual expenditures per fund ledger code.
Expenditure Per Fund Ledger Code - Top 10	Displays a bar chart of the top 10 expenditures per fund ledger code.

https://knowledge.exlibrisgroup.com/Alma/Product_Documentation/010Alma_Online_Help_(English)/080Analytics/060Out-of-the-Box-Reports

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https://redlink.com/library-dashboard/
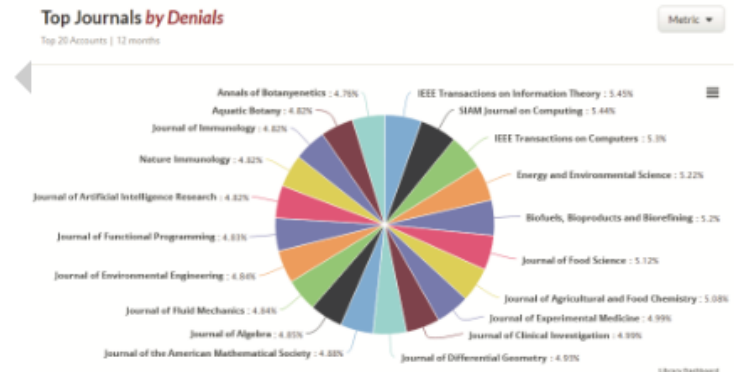
The College of New Jersey Library

"The authors investigated quantitative methods of collection use analysis employing library data that are available in ILS and ILL systems **to better understand library collection use and user need**s.

For the purpose of the study, the authors extracted circulation and ILL records from the library's systems using data-mining techniques. By comparing these data to records of books acquired in a four-year period, the study reveals generally good collection use as well as some unmet collection needs. The study also offers a method of compiling and sharing these multiple types of usage data among work groups to create feedback **mechanisms to inform the work of selectors and suggest modifications to collection development practices.**

Mining and Analyzing Circulation and ILL Data for Informed Collection Development. Forrest E. Link, Yuji Tosaka, and Cathy Weng. College & Research Libraries September 2015

Usage data on their own…give libraries and publishers very little insight into how content is being used or how much it is being looked at.

In spite of the huge amount of data that are now available to libraries, it feels as if **little progress has been made in developing metrics that may give an indication of how resources are being used** and the extent to which library users value the resources provided. These perceived shortcomings in conventional usage data led Nottingham Trent University and Alexander Street to partner in piloting an in-depth view of **analytics, demonstrating user engagement and impact of use**.

Project COUNTER …..provides consistency in reporting, but it does not reveal which individual titles or subjects are used or for what purpose.

Adey, H., & Eastman-Mullins, A. (2017). User engagement analytics case study: how customer behaviour can drive intelligent library decision making. Insights, 30(3), 138–147. DOI: http://doi.org/10.1629/uksg.387
https://insights.uksg.org/articles/10.1629/uksg.387/

PAPR | PRINT ARCHIVES
PRESERVATION REGISTRY

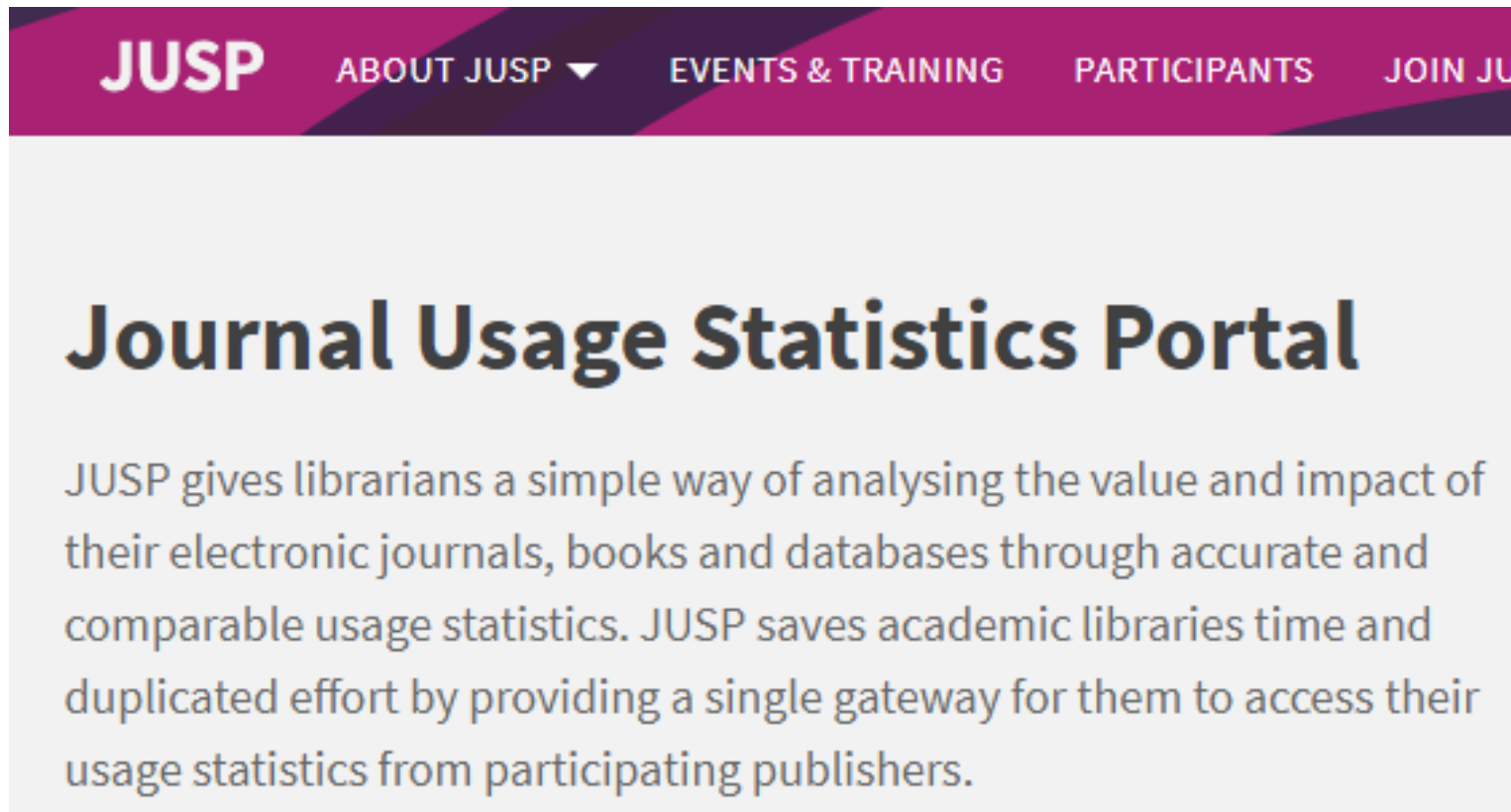"Academic Libraries of Indiana (ALI): ALI-PALNI Shared Print Project: In 2013, 36 Indiana academic libraries came together to take part in the ALI/PALNI Shared Print Project. By sharing their resources, the **libraries were able to engage Sustainable Collection Service**s to analyze the circulating print monographs of each library individually and as a whole. The Project has both short-term and long-term goals. In the short-term**, libraries are able to make data-driven decisions about weeding their collections** and reclaim space for student use. As we look to the future, **the Project can also be the foundation for a shared collection mindset and allow greater cooperative collection development.**

http://papr.crl.edu/program/67/academic-libraries-of-indiana-ali-ali-palni-shared-print-project

In early 2016 the White Rose Libraries (at the universities of Leeds Sheffield and York) began work with GreenGlass to carry out an analysis of their collections in order to explore collaborative collection management between the 3libraries. GreenGlass is a collection analysis tool developed by Sustainable Collection Services (SCS), who are now part of OCLC.

Catalogue records from the 3 White Rose libraries were loaded into GreenGlass in the summer of 2016. **SCS analysed this metadata in terms of a range of factors such as circulation history; publication date; holdings across certain pre-agreed groupings of peer libraries.** Classification was also 'normalized' across the three libraries' differing schemes by a SCS methodology which awarded a DDC number to each work.

Understanding Collections Overlap. An investigation into White Rose Libraries. collections using Collection Management Tools. Jisc July 2017
https://blog.ccm.copac.jisc.ac.uk/wp-content/uploads/sites/13/2017/09/Understanding-collections-overlap-final-report-July-2017-including-appendices.pdf

Journal Usage Statistics Portal

JUSP gives librarians a simple way of analysing the value and impact of their electronic journals, books and databases through accurate and comparable usage statistics. JUSP saves academic libraries time and duplicated effort by providing a single gateway for them to access their usage statistics from participating publishers.
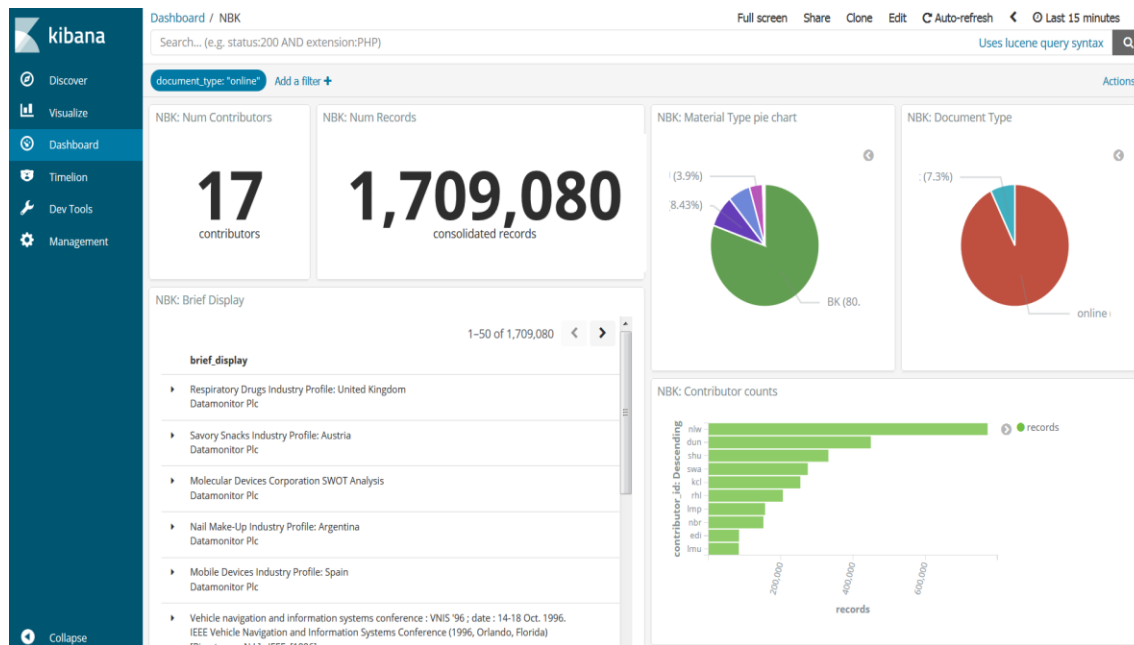
https://jusp.jisc.ac.uk/

Shared initiatives: The NBK

During 2019 NBK will work to deliver improved collection analysis tools using Elastic Search:

- Faceted search options, such as format, date, material type: enabling better collection analysis
- More data visualisation and benchmarking tools
- Data quality indicators
- Institutional data analysis tools:

Hierarchy of analytics use in libraries

Level 1 - Any analysis done is library function specific. Typically ad-hoc analytics but there might be dashboard systems created for only one specific area (e.g. collection dashboard for Alma or web dashboard for Google analytics)

Level 2 - A centralised library wide dashboard is created covering most functional areas in the library

Level 3 - Library "shows value" runs correlation studies etc

Level 4 - Library ventures into predictive analytics or learning analytics

By the time you reach level 4, it would be almost impossible fo library to go it alone.

5 reasons why library analytics is on the rise. Aaron Tay. Musings about librarianship [blog]
http://musingsaboutlibrarianship.blogspot.com/2016/11/5-reasons-why-library-analytics-is-on.html

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Library related data only gets you so far

"Every time a student interacts with their university – be that going to the library, logging into their virtual learning environment or submitting assessments online – they leave behind a digital footprint. **Learning analytics is the process of using this data to improve learning and teaching**"

Learning analytics in higher education: A review of UK and international practice. Read our updated briefing on learning analytics and student success from January 2017. By Niall Sclater, Alice Peasgood & Joel Mullen. Jisc. 2016. https://www.jisc.ac.uk/reports/learning-analytics-in-higher-education

Effective learning analytics

Helping further and higher education organisations to analyse and understand their data

Just completed — This project ended on 31 August 2018

4 years and 1 month
Ended 31 Aug 2018

Budget:
Over £1m

Expected outcome:
Service development

Tags: DATA AND ANALYTICS

We're working in collaboration to build a learning analytics service for the sector. There are over 50 universities and colleges signed up to the initial phases of the implementation.

Are you looking for

GUIDE
Code of practice for learning analytics
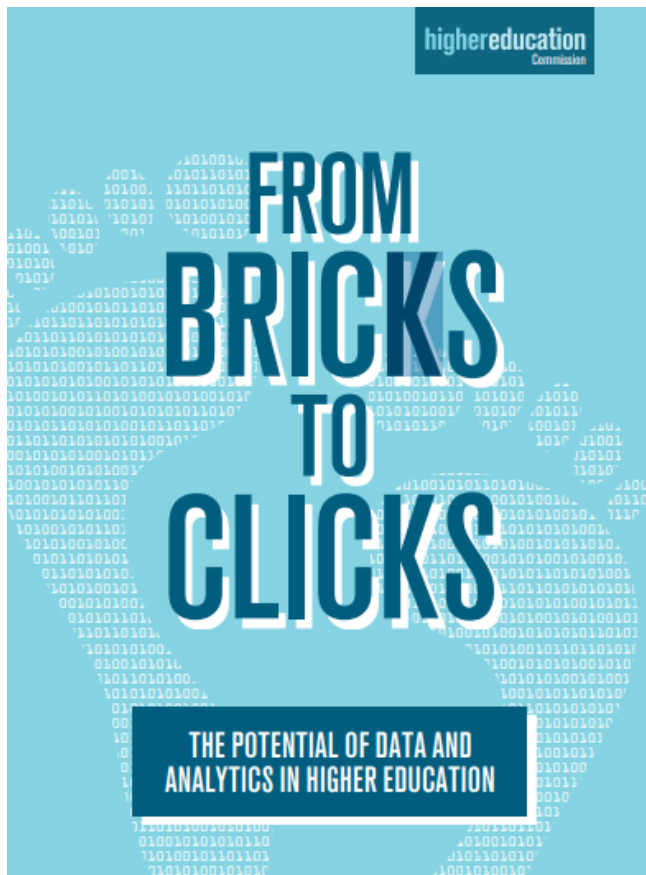
We **recommend that all institutions should consider introducing an appropriate learning analytics system** to improve student support and performance.

https://www.policyconnect.org.uk/hec/research/report-bricks-clicks-potential-data-and-analytics-higher-education

Learning analytics – also *for* students

Academic Development and Quality | NTU Student Dashboard

Student success | **Success for All** | **NTU Student Dashboard** | **Enabling Student Development & Achievement**

The NTU Student Dashboard is a learning analytics resource for students and relevant staff at NTU. It has been developed to help students engage more effectively with their studies. The dashboard measures students' interactions with various resources to present an overall picture about each student's engagement with their course.

These resources are:

> use of NOW

> course work submitted through NOW

> library use (count of resources used)

> door swipes (where applicable).

> attendance

> e-book usage

Each student then receives an engagement rating from high to low. These are criterion based and in theory every student could achieve a high engagement rating. We have tested student engagement against student academic outcomes and there is an association between average engagement and both progression from the first year and final year degree attainment. Students with a high average engagement do far better than those with a low average engagement in both progression and attainment. Importantly, having high engagement is a far more powerful predictor of academic success than any background characteristic or entry qualification.
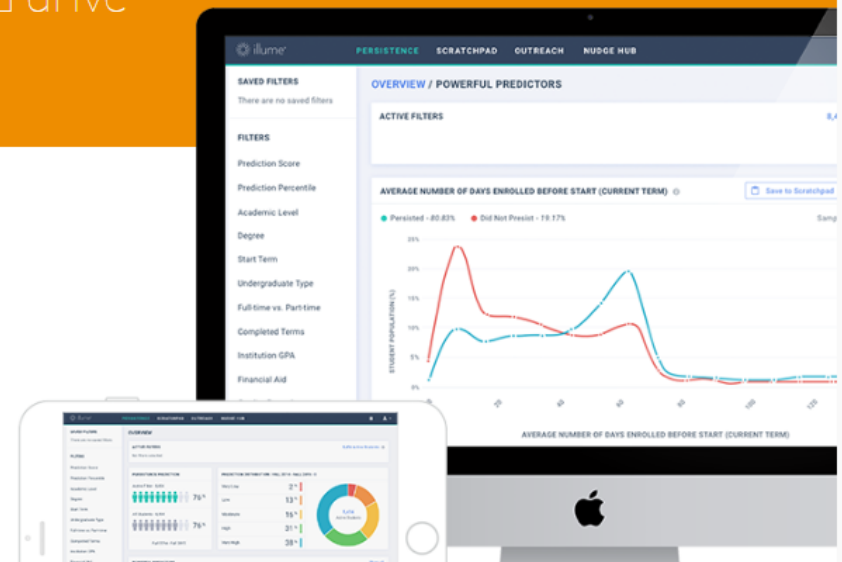
Learning analytics
Harness the power of your data

Put your data to work

Your university or college already collects a variety of data about students and you can use it to:

- Transform their learning experience
- Support their wellbeing
- Help them to achieve more

Our learning analytics service helps you put your data to work to tackle some of the big strategic challenges – and we will support you every step of the way.

It is the world's first national learning analytics service developed to address the key strategic goals of HE and FE organisations.

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Can collection development be done more effectively by algorithms (AI?) – i.e. without human (librarian) intervention?

Yes (technically feasible) …………. But……..

Who might do it?
Individual institutions?
Publishers?
Intermediaries?
Sector bodies?
Data companies?

Capabilities required?
Access to good, appropriate data
Machine intelligence – AI
Platform to deliver the service
Integration with the supply chain
A workable biz model

'Whoever acquires and controls the data will have hegemony in the future

Indian Prime Minister Narendra Modi
World economic forum . January 2018

https://www.analyticsindiamag.com/modi-wef-davos-data-control-real-wealth/

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